

MARYLAND LIFE SCIENCES ADVISORY BOARD

As Required by Economic Development Article

Section 3-205

Respectfully submitted to the General Assembly of Maryland by

Kelly M. Schulz

Maryland Department of Commerce

401 East Pratt Street

Baltimore, MD 21202

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Larry Hogan, Governor | Boyd Rutherford, Lt. Governor

Introduction

The Life Sciences Advisory Board (LSAB) was established by Chapter 304, Acts of 2007, for the purpose of maintaining Maryland's preeminence in the life sciences industry. The function of the board is to:

- Develop a comprehensive strategic plan for life sciences in the State of Maryland;
- Promote life sciences research, development, commercialization and manufacturing in Maryland;
- Promote collaboration and coordination among life science organizations in Maryland;
- Promote collaboration and coordination among research institutions of higher education in Maryland;
- Develop a strategy to coordinate state and federal resources to attract private sector investment and job creation in the life sciences;
- Develop a strategy to support federal life sciences facilities located in the state, including support for education, transportation, housing and capital investment needs; and
- Make recommendations to address critical needs in the life sciences, including access to venture capital and capital construction funding.

In performing its duties, the LSAB is to give due consideration to the business, scientific, medical, and ethical aspects of the life sciences industry.

Fiscal Year 2019 Board Composition

The current LSAB was appointed by Governor Larry Hogan on February 13, 2016 to serve a two-year term. The Board consists of the following members:

Chair: Jay A. Perman, M.D., President - University of Maryland, Baltimore

Vice Chair: Douglas Jon Liu, Senior Vice President, Head of Global Operations –

Qiagen Sciences Inc.

Appointed Members: Christopher P. Austin, M.D., Director, National Center for Advancing

Translational Sciences – U.S. National Institutes of Health

Col. Andrea Stahl, Ph.D., Director, MRMC CBRN Defense Medical Research Coordinating Office and JPC-Radiation Health Effects - U.S. Army Medical Research & Material Command

Frank F. Weichold, M.D., Ph.D., Director, Critical Path and Regulatory Science Initiatives, Office of the Commissioner – U.S. Food and Drug Administration

Richard A. Bendis, *President and CEO - BioHealth Innovation, Inc.*

David W. Smith, Ph.D., Vice President, Global Business Development, Emerging Technologies – Lonza Walkersville, Inc.

William Hearl, President and CEO - Immunomic Therapeutics, Inc.

Christy Wyskiel, Senior Advisor to the President and Head of Johns Hopkins Technology Ventures, Johns Hopkins University

Sanjay K. Rai, Ph.D., Chief Academic Officer and Senior Vice President for

Academic Affairs - Montgomery College

Jarrod Borkat, Vice President, Corporate Strategy, Emergent BioSolutions Karen L. Proudford, Ph.D., Associate Professor of Management and Director, Graves Honor Program – Earl G. Graves School of Business & Management Morgan State University; President, William E. Proudford Sickle Cell Fund. Inc.

Robert Storey, Principal, The MVR Company

Theodore J. Olsen, President and CEO - PathSensors, Inc.

Wendy Perrow, MBA, CEO - AsclepiX Therapeutics

Standing Member: Kelly M. Schulz, Secretary – Maryland Department of Commerce

George Davis, Chief Executive Officer – TEDCO

Recommendations

In 2017, the Maryland Life Sciences Advisory Board issued the BioHealth Acceleration Initiative: Recommendations for Accelerating the Growth of the BioHealth Industry in Maryland. In 2019 the LSAB remained focused on implementing on that set of recommendations. Below is an overview of initiatives and actions that occurred during the year in support of those recommendations.

Leverage and Grow Current Asset Base and Accelerate Commercialization

- Develop and implement the Maryland Medical Device GPS (Guidance, Prioritization, Support), an initiative to:
 - Identify healthcare needs, and uses 'market-pull' information to drive innovation;
 - De-risk investment, and accelerates development of new devices;
 - Steward companies/technologies through Maryland's MedDev ecosystem;
 - Analyze data to identify where patient outcomes can be improved (i.e. hospital admissions reduced and/or cost of care reduced at entities such as the CMS, MHA, MDH, CareFirst);
- Form a Federal Task Force on Commercialization to support enhanced technology transfer and commercialization from federal research labs.
 - Support and contribute to NIST's Green Paper on Tech Transfer from Federal Labs
 - Support and contribute to Maryland Department of Commerce's reports and legislative initiatives
 - Support U.S. Department of Commerce's and the Federal Lab Consortium's forums on transformational innovations and technologies.

Increase Connectivity Among and Awareness of Maryland's BioHealth Assets and Resources

- Contribute to an innovative RFP to facilitate the private sector's access to WRAIR's Pilot BioManufacturing Facility;
- Promote the BioHealth industry in Maryland and globally using a consistent brand and messaging at trade shows such as:
 - o BIO 2019 International Convention
 - AdvaMed MedTech Conference
 - o MEDICA 2019
 - Arab Health Trade Show

- Promote the BioHealth industry in Maryland and globally using a consistent brand and messaging brand during international trade delegations with regions such as:
 - United Kingdom Midlands Region
 - o Quebec, Canada
 - O Kanagawa, Japan
- Develop comprehensive Maryland BioHealth asset map and interactive web site (ongoing)
- Connect Maryland's industry with federal resources, such as the Maryland Innovation and Technology Series taking place at the National Institutes of Health

Increase Availability and Access to Capital for Early through Advanced Stage BioHealth Companies

- Support the Emerging Maryland Asset Delivery Model
- Support local investment conferences, such as the BioHealth Capital Region Investment Conference
- Advocate for the funding of existing State BioHealth financial programs
- Increase the connectivity between life science investors and the BioHealth startup community
- Advocate for a fund to provide Small Business Innovation Research (SBIR) assistance to increase win rate of non-dilutive capital and provide SBIR/STTR matching dollars (2019).

Grow Talent Pool of Experienced BioHealth Entrepreneurs, Business Leaders, Graduates and Scientists with Commercially Relevant Experience

- Enhancing entry-level pipelines from research institutions to industry, through programs such as the Bridges to Biotech Program
- Engage with the Mid-Atlantic Biology Research and Career network (MABRC) and support its programming efforts
- Identify gaps and support programming to train C-Level entrepreneurs that are proficient in science & technology, and business

Appendix 1 - LSAB Meeting Minutes

MINUTES

MEETING DATE: Friday, November 30, 2018

TIME: 1:00 P.M. - 3:00 P.M.

LOCATION: The University of Maryland, Baltimore, Saratoga Building

220 North Arch Street, Baltimore, MD 21201

I. Welcome and Introductions

II. Call to Order

Jay Perman, M.D. - Chair, LSAB President, University of Maryland, Baltimore

Dr. Perman gave opening remarks. He introduced Secretary of Commerce Mike Gill.

III. Message from the Governor

Mike Gill - Secretary, Maryland Department of Commerce

Secretary Gill, on behalf of the Governor and Commerce, summarized the strengths of the innovation sector and updated group regarding the Excel Maryland Fund.

IV. Review and Acceptance of May 15, 2018 Minutes.

Minutes were reviewed and approved, as motioned by Dr. Perman.

IV. Discussion - Maryland BioTechnology Tax Credit

Ben Wu - Deputy Secretary, Maryland Department of Commerce

Ben Wu gave an update on potential legislative initiatives impacting the Maryland Biotechnology Investment Incentive Tax Credit program. He reviewed how the tax program functions in the context of the 2017 legislative changes. He highlighted the uncertainty of the economic impact and the return on investment from the companies in the program. The program was oversubscribed for the first time in 2017. He also summarized the findings from the series of industry meetings held across the State about how to best improve the program. A discussion of investor uncertainty caused by the limited funds ensued. Senator King would like to change the program with the help of the LSAB, and the bill will likely be reviewed by LSAB. The team then highlighted recent successful companies that were aided by the tax credit. Jarrod Borkat suggested that the program should include additional metrics to qualify QMBCs that outline a roadmap for business development.

VI. Discussion - Working Group Updates:

Jay Perman and Bret Schreiber introduced the LSAB working groups. Bob Storey summarized the goals and priorities of Working Group 1; Leverage and grow current Asset base and Accelerate Commercialization. Of note, the group is compiling a list of health priorities needs that will be able to guide innovators so that inventions have a higher likelihood of reimbursability by payers. The technology subcommittee of the FDA Testbed initiative will aid in developing the metrics required to pass the regulatory process and will be applying those metrics to novel technologies that participate in the testbed.

Doug Liu summarized the work from Working Group 2; Increase Connectivity among and awareness of MD's biohealth assets and resources. He introduced the WRAIR initiative, NIMBL, and the advertising efforts of Commerce. Bret Schreiber and Ernesto Chanona expanded on the WRAIR initiative, where companies have been invited to use the excess capacity of their Pilot BioProduction Facility.

Bret gave an update on Working Group 3; Increase availability and access to capital for early through advanced stage BioHealth companies. The Maryland Asset Model was summarized. George Davis suggested that more partners would be necessary for optimal implementation of the Maryland Asset Model. Richard Bendis highlighted the BioHealth Capital Region Investment Forum which was successful in attracting investors to the state. Bret emphasized that capital initiatives should continue to be led by the private sector.

Bret gave an update on Working Group 4; Grow Talent Pool. Bret emphasized the need for a training program to build C-level talent, but also the efforts of training entry-level programs through those such as the Biotechnical Institute of Maryland. He also mentioned the entry-level digital badging initiative from the UMD and community colleges, to help employers understand the technical and soft skills attained by the graduates. Nina Lamba expanded on the Bridges to Biotech Program that helps post-docs acquire soft skills for biotechnology careers. A discussion on a C-level leadership program for life sciences, who have mid-level management experience, ensured. Steve Pennington suggested "Why Maryland" story will help in recruiting talent to the state.

Rich Bendis summarized the accomplishments of Working Group 5 - Task Force on Federal Commercialization Opportunities. He summarized the white paper "For the Competitiveness of the Nation and the Prosperity of the Region: Improving Technology Commercialization and Localizing the Impact of Federal Laboratories in the Greater Washington Region." The reauthorization SBIR pilot programs will continue funding entrepreneurs-in-residence (EIRs), and the efforts of this working group with Maryland's congressional delegation has added 5 additional EIRs. The program at the NIH will allow access to companies that are further along in their research to apply for Phase II funding. He also mentioned that *Genetic Engineering* ranked Maryland 4th in biotechnology cluster rankings in 2018. Bret re-capped the policy deliverable that will include the input from U.S. Senate Committee on Small Business and Entrepreneurship, the LSAB and the Small Business Administration Technology Subcommittee. Jarrod Borkat suggested we mitigate the risk of looking too region-specific by showing that Maryland is a template for federal programs that then be implemented in other states.

VII. Discussion: LSAB Progress to Date - Annual Report Highlights

Bret Schreiber, Senior Director, Office of BioHealth and Life Sciences

Bret provided a very brief overview of other key accomplishments from the Life Science industry in Maryland. He discussed the Annual report on the activities of the LSAB for the preceding fiscal year. Commerce's report will update the progress from the April 2017 report, "BioHealth Acceleration Initiative - Recommendations for Accelerating the Growth of the Biohealth Industry in Maryland." Bret then summarized other recent business successes and company recruitments efforts, including "Project Element" brining 800 new jobs to Frederick, the Viva White Oaks campus near the FDA, Boeing's 3D Printing facility, and the Fischell Institute for Biomedical Devices.

VIII. Next Steps - LSAB Vision for 2019 and Deliverables for 2018

Jay Perman Mike Gill Bret Schreiber

Dr. Perman then suggested the group meet again in February to outline concrete next steps for 2019.

IX. Adjournment

Attendees:

Jay Perman, Chairman of LSAB, President, UMB

Douglas Liu, Vice Chairman of LSAB, Senior VP of Global Operations, Qiagen

Rich Bendis, President & CEO, BioHealth Innovation

Jarrod Borkat, Vice President, Corporate Strategy, Emergent BioSolutions

Bill Hearl, CEO, Immunomic Therapeutics

Ted Olsen, President, PathSensors, Inc.

Wendy Perrow, President, AsklepiX

Sanjay Rai, Sr. Vice President, Montgomery College

Bob Storey, Principle, MVR

Frank Weichold, Director of Office of the Commissioner, US FDA

Mike Gill, Secretary, Maryland Department of Commerce

George Davis, CEO, TEDCO

Commerce Staff:

Ben Wu Steve Pennington Brady Walker Bret Schreiber Nina Lamba Ernesto Chanona

Not Attending

Chris Austin, Director, NCATS, NIH
Laurie Locascio, VP of Research, UMCP
Karen Proudford, Professor of Management & Director of Graves Honor Program, Morgan
State University
David Smith

MINUTES

MEETING DATE: Wednesday, June 19, 2019

TIME: 9:30 A.M. - 11:30 A.M.

LOCATION: Rye Street Market

13 Rye Street, Baltimore, MD 21230

1:00 p.m. Welcome and Introductions

II. Call to Order

Jay Perman, M.D. - Chair, LSAB President, University of Maryland, Baltimore

Dr. Perman gave general opening remarks. He highlighted the focus of this meeting as a recap of activity since May 2018, and to provide for a discussion on how to begin visioning for 2019. He stated that 2017 was for preparation of the Report; 2018 was geared toward "moving the needle" to implement action plans and recommendations from the report. The purpose of the meeting was also for Working Groups to give progress reports on year to date activities.

III. Message from the Governor

Mike Gill - Secretary, Maryland Department of Commerce

Sec. Mike Gill gave remarks on behalf of the Governor and Commerce.

IV. Review and Acceptance of May 15, 2018 Minutes

IV. Discussion - Maryland BioTechnology Tax Credit

Ben Wu - Deputy Secretary, Maryland Department of Commerce

Ben Wu gave an update on potential legislative initiatives impacting the Maryland BioTechnology Tax Credit Program. He highlighted that commerce held a series of industry meetings across the State about how to best improve the program in Maryland. Ben Wu also talked about these activities and about getting the support of the LSAB for efforts to enhance the program during the 2019 Legislative Session of the Maryland General Assembly.

VI. Discussion - Working Group Updates:

Jay Perman

Each Working Group Chair spent 5 minutes providing an update on the progress of the working groups to date, and held a 5 minute discussion.

- Working Group 1 Leverage and grow current Asset base and Accelerate Commercialization - (Chair - Bob Storey)
- Working Group 2 Increase Connectivity among and awareness of MD's biohealth assets and resources (*Chair Doug Liu*)
- Working Group 3 Increase availability and access to capital for early through advanced stage BioHealth companies (*Chair Wendy Perrow*)
- Working Group 4 Grow Talent Pool of experienced BioHealth entrepreneur's, business leaders, graduates and scientists with commercially relevant experience (*Chair Laurie Locascio*)
- Working Group 5 Task Force on Federal Commercialization Opportunities (Chair Rich Bendis)

VII. Discussion: LSAB Progress to Date - Annual Report Highlights

Bret Schreiber, Senior Director, Office of BioHealth and Life Sciences

Bret Schreiber provided a very brief overview of other key accomplishments occurring in the Life Science industry in Maryland. He explained that additionally, the Department of Commerce is required to issue an Annual report on the activities of the LSAB for the preceding fiscal year. Commerce's report will update the progress from the April 2017 report, "BioHealth Acceleration Initiative - Recommendations for Accelerating the Growth of the Biohealth Industry in Maryland."

VIII. Next Steps - LSAB Vision for 2019 and Deliverables for 2018

Jay Perman Mike Gill Bret Schreiber

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Wendy Perrow, President, AsklepiX

Laurie Locascio, VP of Research, University of Maryland

Bob Storey, Principle, MVR

Frank Weichold, Director of Office of the Commissioner, US FDA

Christy Wyskiel, Senior Advisor to the President, Johns Hopkins University (*Maybe*)

Ex Officio Members:

Kelly Schulz, Secretary, Maryland Department of Commerce

Commerce Staff:

Kyle McColgen Signe Pringle Bret Schreiber Ernesto Chanona

Not Attending

Jarrod Borkat, Vice President, Corporate Strategy, Emergent BioSolutions Sanjay Rai, Sr. Vice President, Montgomery College George Davis, CEO, TEDCO